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but little evidence in favour of this conclusion. If Tisserand were correct, it would indicate that the internal layers of the earth are more elliptic than is consistent with the present angular velocity of rotation. On the other hand, Dr. Wiechert seeks to show that his iron nucleus is deficient in ellipticity. His argument does not, however, carry conviction to my mind, as the data seem to be too uncertain for any such conclusion. It is, I think, preferable to maintain that nothing can, as yet, be decided on this point.

Note on the Values of the Coefficients of the terms of the Third Order in the new Lunar Theory. By Ernest W. Brown, M.A.

In the Memoirs of the Society, vol. liii. pp. 163–202, I have given the values of the coefficients of all terms of the third order with respect to the eccentricities, the inclination, and the ratio of the parallaxes; these values include all powers of the ratio of the mean motions since the numerical value of this ratio has been used. The results are given for rectangular coordinates. They also include the parts of the ratio of the mean motions, as far as these depend on the squares of the eccentricities, the inclination, and the ratio of the parallaxes. The values of the latter have been re-calculated since my paper of March 1897[*] appeared, and no sensible differences from the values there given appeared. Instead of the value $-1739''\cdot6$ in the part of the motion of the perigee of the form $n\gamma^2 f(m)$ should be put $-1739''\cdot8$ (see p. 338 of the paper referred to); and for the value $-616''\cdot0$ in the part of the motion of the node of the form $ne^2 f(m)$ should be put $-616''\cdot1$ (p. 340). I may add that differences from Delaunay's values, after proper estimation had been made for the remainders of his series in powers of m, were found in the cases only of the parts of the motion of the perigee, which were of the forms $ne^2 f(m)$ and $ne'^2 f(m)$. The latter difference was found to be due to an error in Delaunay's theory, which was actually detected (*loc. cit.* pp. 340, 341). The former difference seemed to be due also to an error in Delaunay's theory in view of the three quite separate determinations which I have made, and which agree amongst themselves. If Delaunay's value had been correct, a difference from the observed value of about $26''$ in the annual motion of the perigee would have resulted. Hansen's and my values differ by less than $2''$ from the observed value. We must therefore conclude that in all probability Delaunay is in error.

These errors would naturally cause differences in the coefficients of $\sin(2i\mathrm{D}+l)$, $(i=\pm 1, \pm 2, \ldots)$ in longitude between Delaunay's theory and mine, as far as these coefficients depend on e^3m^j, ee'^2m^j. I have transformed my results to polar co-ordinates

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[*] *Monthly Notices of R.A.S.*, vol. lvii. p. 332–341.

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in order to compare them with those of Delaunay. Only one difference was found which seemed to indicate an error when estimation was made for remainders in Delaunay's results, and this difference was precisely where it might have been expected, namely, in the part of the coefficient of sin $(2D-l)$, which is of the form $e^3f(m)$. The part of this coefficient, which is of the form $ee'^2f(m)$, is not carried sufficiently far in Delaunay's theory to notice any difference, as the series in powers of m converges very slowly. The part of the form $e^3f(m)$ in my theory contributes $-1''\cdot23$; in Delaunay's theory it is $-1''\cdot13$, or, when estimation is made for the remainder, $-1''\cdot07$. These small differences in the values of the coefficients of the periodic terms are, of course, not very important practically, but the comparison furnishes a valuable test of the accuracy of the various calculations, and in this respect there is no cause for dissatisfaction.

The terms of the fourth order are now nearing completion, and, so far as the various tests have been able to be applied, appear to fulfil the degree of accuracy which was aimed at. They have demanded more extended calculations than the terms of any other order have required or will require. Circumstances prevent them going forward very rapidly at present; but it is hoped that they may be ready for publication within the next twelve months.

Haverford College, Pa.:
1899 *November* 3.

On the proper Motions of Berlin B, Nos. 5072 *and* 5073.
By F. A. Bellamy.

In the comparison of Plate 1415, taken at the University Observatory, Oxford, for the *Astrographic Catalogue* in 1899, R.A. $14^h\ 20^m$, $+25°$, with stars in the *Astronomische Gesellschaft* Catalogues of Cambridge and Berlin, a large discordance was noticed between the Oxford measures and two stars Nos. 5072 and 5073 in the Berlin B Catalogue.

Failing to find any notification of an error or discordance in the *Bonn Durchmusterung* or Berlin B Catalogue, or any proper motions from the usual sources of information, we were fortunate to find that another plate of this region had been taken in 1893, but rejected through insufficient number of stars.

For comparison of this plate with 1415 four stars were selected and the measured co-ordinates compared. The linear corrections for reducing plate 399 to 1415 were found to be

$$+\cdot0083x+\cdot0013y-\cdot177 \text{ to } x.$$
$$-\cdot0013x+\cdot0083y-\cdot046 \text{ to } y.$$

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